

# Notice of Allowability

Application No.

09/890,529

Examiner

Carol Chaney

Applicant(s)

POPE ET AL.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment 19 July 2004.
2. ☒ The allowed claim(s) is/are 5-11, 14-17, 19, 20 and 43-48.
3. ☒ The drawings filed on 05 April 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

**EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William Ackerman on 29 September 2004.

The application has been amended as follows:

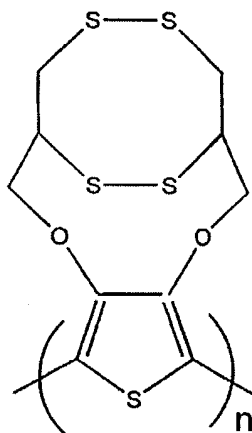
Please ***cancel claims 1-4 and 36-42.***

Please ***cancel claims 12, 13, 18, and 21-35.***

***Please amend claim 5*** at the end of line 14,

delete "." and insert the following --

; wherein the conducting polymer and sulfur species is represented by:



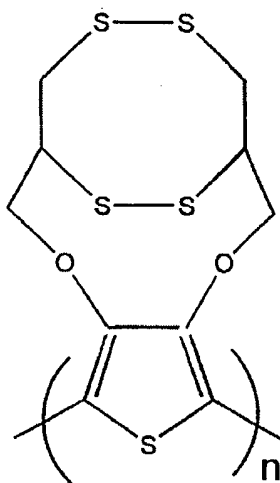
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where n is an integer greater than 20. --

**Please amend claim 9**, at the end of line 4,

delete "." and insert the following —

, represented by:



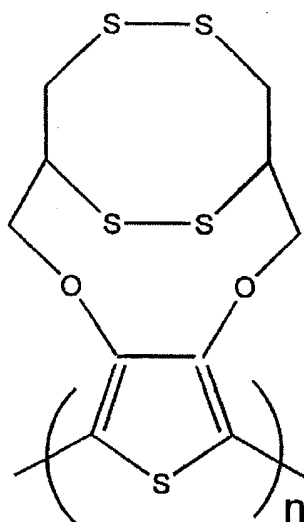
where n is an integer greater than 20. --

**Please amend claim 14**, at the end of line 8,

delete "." in insert the following --

; and the conducting polymer and sulfide components are represented by :

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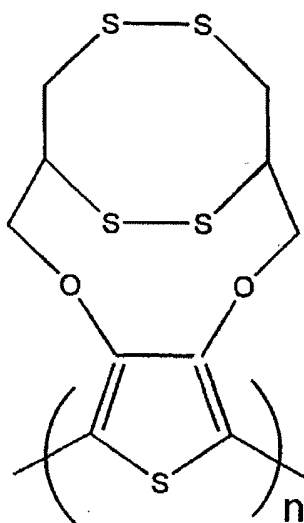


where n is an integer greater than 20. –

***Please amend claim 17,*** at the end of line 16

delete “.” in insert the following --

; and the conduction polymer and sulfur species is represented by :



where n is an integer greater than 20. –

***Please amend claim 16,*** at line 4 by changing “claim 12” to –claim 9--.

***Please amend claim 19,*** at line 1, by changing “claim 18” to –claim 9--.

***Please add the following claims:***

43. (Amended) The cathode material according to claim 5,  
wherein n is greater than 1000.

44. (Amended) The cathode material according to claim 43,  
wherein n is greater than 100,000.

45. (Amended) The cathode material according to claim 14,  
wherein n is greater than 1000.

46. (Amended) The cathode material according to claim 45,  
wherein n is greater than 100,000.

47. (Amended) The cathode material according to claim 17,  
wherein n is greater than 1000.

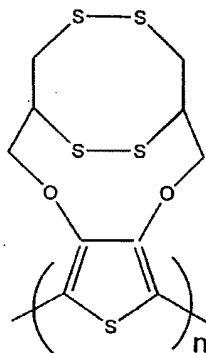
48. (Amended) The cathode material according to claim 47,  
wherein n is greater than 100,000.

***Allowable Subject Matter***

Claims 5-11, 14-17, 19, 20, and 43-48 are allowed.

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The following is an examiner's statement of reasons for allowance: Applicants' claims are directed to cathode materials for sulfur-based lithium batteries comprising a polymer of the form



The material is a conductive polymer having a sulfur species. The specific material is not disclosed or suggested by the prior art. The nearest prior art of Maxfield, US Patent 4,472,488 teaches cathode materials comprising the reaction product of acceptor-doped (oxidized) conjugated backbone polymers and thiophenes, but does not disclose or suggest cathode materials with the specific structure claimed by the applicants. The nearest prior art of Naoi et al., US Patent 5,723,238 and Fauteux discloses sulfur cathodes, but do not disclose polymers of the structure claimed by applicants.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Carol Chaney  
Primary Examiner  
Art Unit 1745

1 October 2004